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Atty Doc. No. HME/7982.001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
PATENT APPLICATION EXAMINING OPERATIONS

In re the Application of :  
Sharon F. Kleyne : Group Art Unit: 1619-17

Serial No. 09/614,790 : Examiner: Michael Willis

Filed: July 12, 2000 : Tel. No. (703) 305-1679

For a Patent for :  
METHOD AND KIT FOR MOISTURIZING  
THE SURFACE OF THE EYE

**DECLARATION OF DR. PHILIP PADEN**

37 C.F.R. §1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir,

1. I, Philip Y. Paden, MD, am a physician and surgeon (ophthalmology) and owner of Paden Eye Care Center, PC in Medford, Oregon. A copy of my curriculum vitae is attached hereto and forms a part of this declaration. I am a paid consultant to Rogue Valley Natural Springs, Inc., a company that commercializes an eye-moisturizing product described and claimed in the application. This company was founded by Sharon F. Kleyne, the inventor of the present application. I am also a shareholder in the company. I am familiar with the prosecution of this application in the U.S. Patent Office.

2. I am submitting this declaration to explain the significance of the disclosed and claimed method for moisturizing the surface of the eye using an aqueous fluid consisting essentially of water and to establish that such a use of water represents a significant departure from previous accepted doctrine in ophthalmology.

3. It is a well established physiological principle that all cells (oral and upper GI mucosa excepted) of the body, including cells on the surface of the eye, are bathed in a fluid having a particular osmolarity and that significant deviations from a narrow range of physiologic osmolarity of the fluid may have deleterious consequences for cells exposed to the fluid. Such consequences may be minor, such as temporary discomfort while the body re-establishes normal osmolarity, or such consequences may be severe, such as osmotic shock whereby exposure of cells to an extremely hypotonic environment results in rupture of the plasma membrane and loss of cell contents causing death of cells.

4. For this reason, it has been a long-recognized and accepted doctrine in ophthalmology that pure water, or an aqueous fluid consisting essentially of water, cannot be used as a topical eye therapy because application of water in the form of a drop, a jet, or a stream would decrease the osmolarity of fluid on the surface of the eye to almost zero and would result in deleterious effects such as stinging sensations or even osmotic shock with damage to cells on the surface of the eye.

5. The present application and the commercial embodiment of the claimed invention (Nature's Tears by Rogue Valley Natural Springs, Inc.) provide a solution to this problem and permit the application of essentially pure water to the surface of the eye. By administering a small quantity of water in the form of small droplets within a mist, water does not displace the tear film but rather is absorbed into the aqueous layer of the tear film. In this way, the hypertonic tear film in a patient suffering from dry eye is restored to within a comfortable physiologic range and there is no resultant irritation or other deleterious effects due to osmotic shock.

6. The way that the mist embodiment of the invention works is explained and illustrated in the accompanying CD disk that is submitted with this declaration as "Paden Exhibit 1." Paden Exhibit 1 is a 3-minute CD presentation produced by Rogue Valley Natural Springs, Inc. to explain their product, Nature's Tears™. This presentation diagrammatically shows how the application of water in the form of a mist restores the desired osmolarity of the tear film to a comfortable physiologic level and does not result in osmotic shock, in contrast to previously accepted ophthalmologic dogma. Maintenance of the lipid and mucin layers are further benefits not previously available in any other dry eye supplement.

Further, Deponent sayeth naught.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1-21-2004  
Date

Philip Paden  
Philip Paden, MD

## **CURRICULUM VITAE**

**Philip York Paden, M.D.**  
**221 Stewart Avenue, Suite 110**  
**Medford, OR 97501**  
**(541) 776-9026**

### **EDUCATION:**

July, 1983 – July 1986  
Residency in Ophthalmology  
Oregon Health Sciences University, Portland, Oregon

1982 – 1983  
Internship in Internal Medicine  
Waterbury Hospital (affiliated with Yale University), Waterbury,  
Connecticut

September, 1978 – June, 1982  
Doctor of Medicine Degree  
Albert Einstein College of Medicine, Medical Division, Bronx,  
New York

June, 1974  
Master of Arts in Science Education  
Cornell University, Graduate Division, Department of Chemistry  
and School of Education, Ithaca, New York

June, 1968  
Bachelor of Arts in Mathematics and  
Bachelor of Science in Chemistry with Highest Distinction  
University of Kansas, Lawrence, Kansas

### **RESEARCH AND ACADEMIC POSITIONS:**

Lecturer in Chemistry, Cornell University  
Full-time faculty 1974-1978

Developed and implemented academic support services for  
minority students. Taught departmental courses in general  
and organic chemistry. Responsible for academic support  
services for all students in general chemistry.

Program Instructor, Cornell University  
COSEP (Minority), Summers 1972-1973

Taught pre-freshman chemistry course to incoming  
freshman science majors.

Research Associate, International Population Program and Cornell University Science, Technology and Society Program, Caracas, Venezuela, Summer, 1971

Designed flow model of municipal family planning services with aim of improving efficiency and utilization of clinical services.

HONORS: University of Kansas, Wade Scholarship in Mathematics, Donnelly Scholarship, Departmental Highest Distinction in Chemistry.

Cornell University, DuPont Outstanding Teacher Award

PUBLICATIONS: Anderson, D.C. and Paden, P.Y.: Passive Avoidance Response Learning as a Function of Prior Tumbling Trauma. Pshychonomic Science, Volume IV, 1966.

Kovach, J.K., Paden, P.Y., and Wilson, G.: Stimulus Variables in the Elicitation and Short-Range Reversibility of Early Approach Philip York Paden, M.D.

Curriculum Vitae – Page 3  
and Following Responses.

Journal of Comparative and Physiological Psychology, Volume 66 (1):175-178, 1968.

Paden, P.Y.: Instructor's Manual with Solutions to Accompany Sienko – Plane Chemical Principles and Properties. McGraw-Hill, New York, 1974.

DeLuise, V.P., Stern, J.T., and Paden, P.Y.: Uveitic Glaucoma Caused by Disseminated Meningococcemia. American Journal of Ophthalmology, 95:707, 1983.

Beyer, R.A., Paden, P.Y., Sobel, D.F., and Flynn, F.G.: Moyamoya Pattern of Vascular Occlusion After Radiotherapy for Glioma of the Optic Chiasm. Neurology, September, 1986.

CONSULTANT TO: Alcon Corporation (Fort Worth, Texas)  
Heidelberg Engineering (Dossenheim, Germany)  
Bio-Logic Aqua Technologies (Grants Pass, Oregon)

Philip York Paden, M.D.  
Curriculum Vitae – Page 3

PROFESSIONAL

ORGANIZATIONS: American Society of Cataract and Refractive Surgery  
American Academy of Ophthalmology  
Jackson County Medical Society

Certified by the American Board of Ophthalmology with Honors

CURRENT

POSITION: Joined the Medical Eye Center in Medford, Oregon in 1986. Started Paden Eye Care Center (in Medford) in August, 2002. Specializing in diabetic eye care, improving visual and refractive results in cataract surgery, and computer imaging technology in glaucoma and diabetic retinopathy.

1-21-2004

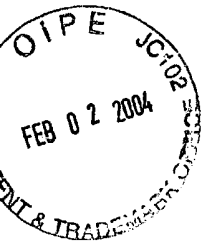
Philip Paden

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
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In re the Application of :  
Sharon F. Kleyne : Group Art Unit: 1619  
  
Serial No. 09/614,790 : Examiner: Michael Willis  
  
Filed: July 12, 2000 : Tel. No. (703) 305-1679  
  
For a Patent for :  
METHOD AND KIT FOR MOISTURIZING  
THE SURFACE OF THE EYE

**DECLARATION OF DR. DARWIN J. LIAO**  
37 C.F.R. §1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir,

1. I, Darwin J. Liao, MD, MPH, am a comprehensive ophthalmologist and a partner in Seattle Eye MDs, a full service ophthalmology clinic in Seattle, Washington. Neither I nor anyone associated with Seattle Eye MDs is affiliated with or receives any compensation from Sharon Kleyne (the inventor of the present application) or from her company, Rogue Valley Natural Springs, Inc. I have met Sharon Kleyne on several occasions.

2. On one occasion, I met Ms. Kleyne at an ophthalmology trade show that I was attending. At that trade show, she told me about her product, Nature's Tears™, and explained how it differed from all other products that are available for alleviating symptomatic discomfort for individuals suffering from dryness of the eyes.

3. Sharon Kleyne explained that other products, such as artificial tears or other formulations in the form of eye drops, deliver a quantity of fluid that is greater than the volume of the tear film. This results in a washing away of the tri-laminar tear film and replacement of this tear film by a mono-layer containing whatever fluid was delivered to the eye. It then takes some time and many blinks for the eye to rid itself of this foreign and unnatural fluid and to reconstruct the normal three-layered tear film. The key, according to Ms. Kleyne, is to provide an aqueous fluid in an amount that is sufficient to re-hydrate the tear film and that leaves the already present tear film in place on the surface of the eye. I have since evaluated Ms. Kleyne's product, Nature's Tears, in my ophthalmology practice.

4. In my practice, I care for many patients who suffer from dry eyes. I have recommended and prescribed to my patients many different therapies for symptomatic relief from dry eye.

5. My experience with eye drop therapies has not been entirely successful. Many of my patients have complained that it is difficult to administer eye drops and that their eyes feel worse a few minutes after using eye drops. This problem of difficulty in administration of eye drop therapy occurs very frequently and is a serious issue in elderly patients and in patients with motor difficulties. Because of these and other problems with eye drops, I have experienced problems in patient compliance as many of my patients apply the eye drops less frequently than recommended or discontinue use of them completely.

6. In my practice, I now dispense to my dry eye patients Nature's Tears, the product sold by Ms. Kleyne's company and which is described and claimed in this patent application. Nature's Tears delivers a very small quantity of aqueous fluid which is sufficient to moisturize the surface of the eye and which leaves the tri-laminar tear film intact on the eye. It does this by delivering water to the eye in the form of a mist.



7. The results I have obtained with Nature's Tears have been outstanding. I no longer receive complaints about discomfort upon or after application or about difficulty in applying eye moisturizing therapy. Many of my patients have even commented to me about how good their eyes feel when they use Nature's Tears. I find this to be very significant because I rarely, if ever, receive comments from my patients about a product when they are satisfied with a product. Rather, comments from patients usually are received only when they are dissatisfied with something. More important than receiving good comments, however, is the fact that my patients continue to use Nature's Tears because it is effective in reducing symptoms of dry eye and the mist is very easy and comfortable to apply to the eye. My elderly patients, many of whom suffer from secondary eye conditions due to eyelid laxity and other such disorders, and my patients with motor difficulties find the Nature's Tears mist very easy to apply. Therefore, I no longer have problems with patient compliance with dry eye topical therapy now that I dispense Nature's Tears.

8. Nature's Tears is now my primary treatment of choice for all my dry eye patients and I also use it as an adjunct therapy for all secondary causes of dry eye, such as those cases of dry eye that require pharmaceutical or surgical intervention.

9. Like many of my patients, I also suffer from symptomatic discomfort due to dry eye. In the past, I have used various eye drop formulations to relieve my dry eye symptoms, but I no longer do so. Now, when my eyes feel dry, I apply Nature's Tears. Like my clients, I have found Nature's Tears to be far more effective in relieving my discomfort due to dry eye than are eye drops.

10. It is my feeling that Nature's Tears is a revolutionary product in the symptomatic treatment of dry eye. It maintains the integrity of the tear film and provides a previously

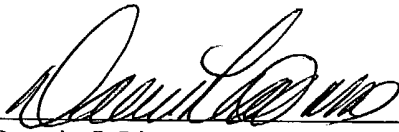
unrealized degree of comfort when used by an individual who is experiencing symptoms of dry eye.

Further, Deponent sayeth naught.

The undersigned declares further that all statements made herein of her own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1-9-04

Date



Darwin J. Liao, MD, MPH

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Sharon F. Kleyne : Group Art Unit: 1619  
Serial No. 09/614,790 : Examiner: Michael Willis  
Filed: July 12, 2000 : Tel. No. (703) 305-1679  
For a Patent for :  
METHOD AND KIT FOR MOISTURIZING  
THE SURFACE OF THE EYE

DECLARATION OF DR. WILLIAM D. MATHERS  
37 C.F.R. §1.132

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir,

1. I, William D. Mathers, MD, am a Professor of Ophthalmology at Oregon Health and Science University – Casey Eye Institute in Portland Oregon. A copy of my curriculum vitae is attached hereto and forms a part of this declaration. I am a paid consultant to Rogue Valley Natural Springs, Inc., a company that commercializes an eye-moisturizing product described and claimed in the application. This company was founded by Sharon F. Kleyne, the inventor of the present application. I am also a shareholder in the company. I am familiar with the prosecution of this application in the U.S. Patent Office.

2. I am submitting this Declaration to provide data that shows that Nature's Tears®, the commercial embodiment of the invention claimed in this application, is more effective and is more convenient to use than are other products that are available for the symptomatic relief of dry eye. Nature's Tears delivers a very small quantity of aqueous fluid to the eye in the form of

a mist. The fluid that is delivered to the eye by the use of Nature's Tears is sufficient to moisturize the surface of the eye and does not disrupt the tri-laminar tear film that is present on the surface of the eye. I was one of three consultants who completed a study to evaluate patient response to Nature's Tears in comparison to other products that patients had previously used for symptomatic relief of eye discomfort.

3. Thirty nine (39) patients were surveyed. Of the 39 patients, 33 (84%) had dry eye. The remaining 6 (16%) were given Nature's Tears for various reasons, such as ocular surface allergies or irritation. Of the 39 patients, 35 (89%) had previously used other eye care products and of these 72% (25) had experienced favorable results with those products. The patients were given Nature's Tears to use freely for 2 weeks, as needed. Telephone interviews were conducted after the two week period.

4. In the survey, the patients were asked if Nature's Tears was more effective, less effective, or about the same compared to other products. The patients were asked if Nature's Tears was more convenient, less convenient, or about the same compared to other products. The patients were asked if they would or would not purchase Nature's Tears.

5. Of the 39 patients surveyed, 72% (28) found Nature's Tears to be more effective than the other products they had used. 24% (9) said that Nature's Tears was about the same as other products they had used. One (3%) said that it was less effective.

6. Of the 39 patients surveyed, 83% (32) said that Nature's Tears was more convenient to use compared to other products. Two of the patients found it less convenient and two of the patients said it was about the same.

7. Of the 39 patients surveyed, 83% said they would purchase Nature's Tears. 17% said that they would not.

8. The data from this study establishes that Nature's Tears eye mist is more effective and more convenient to use than other available products for topical application to the surface of the eye to treat ocular discomfort, such as due to dry eye. The data also shows that most patients who try Nature's Tears would purchase Nature's Tears.

Further, Deponent sayeth naught.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Jan 25th 2004  
Date

William D. Mathers MD  
William D. Mathers, MD

OREGON HEALTH SCIENCES UNIVERSITY  
CASEY EYE INSTITUTE  
CURRICULUM VITAE

**WILLIAM D. MATHERS, M.D.**

**I. Personal Data**

Citizenship Status: U.S.  
Birth date: 12/01/47

**II. Education**

1969	B.S.	Chemistry, Allegheny College, Meadville, PA
1973	M.D.	Stanford Medical School, Stanford, CA

**III. Post-Graduate Education**

1973-74	Intern	Surgery, Stanford Medical School, Stanford, CA
1975-77	Resident	Anesthesiology, Stanford Medical School, Stanford, CA
1982-85	Resident	Ophthalmology, University of Washington School of Medicine, Seattle, WA
1985-86	Fellow	Cornea and External Disease, Georgetown University Medical School, Washington, D.C.

**IV. Academic Appointments**

1977-79	Assistant Professor of Anesthesiology, Stanford Medical School, Stanford, CA
1985-86	Clinical Instructor, Department of Ophthalmology, Georgetown University, Washington, D.C.
1985-86	Faculty Instructor, Center for Sight, Georgetown University Medical Center, Washington, D.C.
1986-88	Assistant Professor of Ophthalmology, University of Arizona, Tucson, AZ.
1988-92	Assistant Professor of Ophthalmology, and Director, Cornea Service, Georgetown University, Washington, D.C.
1992-94	Associate Professor (without tenure), and Director, Cornea Service, Department of Ophthalmology, University of Iowa
1994-97	Associate Professor, (with tenure), Department of Ophthalmology, College of Medicine, University of Iowa, Iowa City, IA
1997-99	Professor, Department of Ophthalmology, College of Medicine, University of Iowa, Iowa City, IA.
1999-	Professor of Ophthalmology, Casey Eye Institute, Oregon Health Sciences University, Portland, Oregon

**V. Other Positions Pertaining to Current Professional Appointments**

1977-79	Chief of Cardiac Anesthesia, Veterans Administration Hospital, Palo Alto, CA
1979-80	Private Practice in Anesthesiology, Albuquerque, NM
1980-82	Private Practice in Anesthesiology, Fresno, CA

## **VI. Certification and Licensure**

### **A. Certification:**

- |                                     |      |          |
|-------------------------------------|------|----------|
| 1. American Board of Anesthesiology | 1980 | No. 9558 |
| 2. American Board of Ophthalmology  | 1987 |          |

### **B. Licensure:**

- |                   |      |       |         |          |               |
|-------------------|------|-------|---------|----------|---------------|
| 1. California     | 1974 | Perm. | G27004  | 12/31/93 | (not renewed) |
| 2. New Mexico     | 1979 | Perm. | 79-225  | 1/1/83   | (not renewed) |
| 3. Washington     | 1982 | Perm. | 0019810 | 3/31/86  | (not renewed) |
| 4. Washington, DC | 1985 | Perm. | 15023   | 12/31/92 | (not renewed) |
| 5. Arizona        | 1986 | Perm. | 16193   | 1/1/88   | (not renewed) |
| 6. Iowa           | 1992 | Perm. | 28643   | 12/1/99  | (not renewed) |
| 7. Oregon         | 1999 | Perm  | MD21605 | 12/31/01 |               |

## **VII. Professional Affiliations (including offices held)**

- Oregon Association of Ophthalmology
- American Academy of Ophthalmology
- American Medical Association
- Washington State Academy of Ophthalmology
- Castroviejo Society
- Association for Research in Vision and Ophthalmology
- International Society for Contact Lens Research
- Contact Lens Association of Ophthalmologists (President 97-98)
- Eye Bank Association of America
- Society for Cataract and Refractive Surgery
- American Board of Ophthalmology - Associate
- Research to Prevent Blindness
- American Diabetes Association
- Pan American Association for Contact Lenses and Refraction (President 97-98)
- American Association for the Advancement of Science
- American Society of Cataract and Refractive Surgery
- Society of Protozoologists
- International Society of Refractive Surgery
- FDA Ophthalmic Devices Panel member
- Society for Neuroscience member
- Founder/Director, Chair Scientific review committee- Wadsworth Foundation for Multiple Sclerosis Research

## **VIII. Areas of Research Interest**

1. Gene regulation in the lacrimal gland Dry eye and tear measurement
2. Uveitis -leukocyte visualization in-vivo
3. Meibomian gland disease
4. In vivo confocal microscopy of keratitis
5. Genetic basis of corneal disease
6. Acanthamoeba keratitis diagnosis and treatment

## **IX. Current Projects**

1. Stimulation stress in the Lacrimal Gland -Gene Array studies
2. Confocal examination of Scleritis and conjunctivitis
3. Keratitis risk assessment
4. Confocal microscopy of Acanthamoeba Keratitis and corneal dystrophy
5. 3D Confocal Microscopy of Corneal structures

## **X. Other Professional Activities**

1991-2000	CLAO Board of Directors
1993	CLAO Journal editorial board
1993-1996	Cornea Journal editorial board
1994-2000	NEI-VISA Study Section, invited committee member
1993-1999	CLAO Board of Directors, Scientific Program Director
1995-2000	Castroviejo Society, board member
1997	CLAO President
1998-2000	Schepens Scientific Advisory Committee member
1999-2000	Pan American Association for Contact Lenses and Refraction, President
2001	Founding member, chair scientific review: Multiple Sclerosis Foundation
2001	FDA Ophthalmic Devices Committee Member
2001	Nugent Award for Corneal Research-recurring support
2002	RPB Physician-Scientist Award

## **XI. Collegiate, University, University Hospitals, and National Committees**

### **National Committees:**

1989	FDA Joint Council on Contact Lens Compliance
1990	Contact Lenses Council
1990	CLAO Industrial Standard Committee
1991	CLAO Continuing Medical Education Committee
1992	Scientific Program Director for CLAO & Annual Meeting
1992	Medical Director Iowa Lions Eye Bank
1993	Editorial Board CLAO Journal
1993	Associate Director Eye Injury Registry of Iowa
1994	Editorial Board of Cornea
1996	EBAA Eye Bank Assoc of Am. Paton committee
1994-2000	VIS-A Study Section, NIH
2001-2003	FDA Ophthalmic Devices Panel member

## **XII. Honors and Awards**

- American Field Service Scholarship, 1963
- ALCOA National Scholarship, 1964
- American Academy of Ophthalmology Honor Award, 1993
- Tuohy Lectureship, Contact Lens Association of America Award, 1994
- American Ophthalmologic Society (nominated)
- Keynote Address-Second International Conference on the Lacrimal Gland 1996
- Kersley Memorial lecture, Moorefields England 1999
- Behren's Memorial lecture, CLAO Annual Meeting 2000
- RPB Physician Scientist Award
- Nugent Award for Corneal Research



### **XIII. Financial Resources (Grants and Contracts)**

#### **A. Federal (NEI)**

Tear Production, the Ocular Surface, and Contact Lenses National Eye Institute (EY04361-05), funded 1986-1991 William D. Mathers, M.D., Co-Investigator	\$955,000
Meibomian Gland Dysfunction in Chronic Blepharitis National Eye Institute (EY10151-01), submitted 2/1/1991 (3-year grant awarded 12/91; activate 9/92) William D. Mathers, M.D., Principal Investigator	\$562,187
Tear Function in Blepharitis and Dry Eye National Eye Institute (R01EY10164-04) funded 12/01/1995 (5-year grant) William D. Mathers, M.D., Principal Investigator	\$1,078,020
Molecular Genetics of Corneal Dystrophies National Institutes of Health (R01EY11543-01) awarded 6/96 (5 year grant) William D. Mathers, M.D., Co-Investigator	\$800,000
Confocal Diagnosis of Acanthamoeba Keratitis National Institutes of Health (1R01EY11667-01) Awarded 11/96 (2 year grant) William D. Mathers, M.D., Principal Investigator	\$210,000
Tear Function in Blepharitis and Dry Eye National Eye Institute (7R01-EY10151-08) funded 3/99- 2/01 (grant forwarded to OHSU) William D. Mathers, M.D., Principal Investigator	\$242,634.00
Enhanced Diagnosis of Acanthamoeba Keratitis National Institutes of Health (7R01-EY11667-03) Awarded 3/99-9/00 (grant forwarded to OHSU) William D. Mathers, M.D., Principal Investigator	\$71,493.00
Ocular Inflammation and Dry Eye Medical Research Foundation of Oregon Awarded 12/1999 William D. Mathers, M.D. Principle Investigator	\$25,000.00
Nugent Award for Corneal Research Awarded 2001 yearly William D. Mathers, M.D.	\$150,000.00
RPB Inc. Physician-Scientist Award Awarded 2001 William D. Mathers, M.D.	\$55,000.00

In Vivo Imaging of Leukocyte-Endothelial Dynamics     \$144,941.00  
 DHHS NIH National Eye Institute  
 Awarded 2003 (RO3-EY014013-01)  
 William D. Mathers, MD

**B. College of Medicine**

Color Specular Microscopy of the Dry Eye     \$ 6,000  
 to Evaluate Currently Used Medications  
 Biomedical Research Support Grant Committee (BRSG),  
 funded 1987 - College of Medicine, University of Arizona

Ocular Inflammation and Dry Eye     \$25,000  
 Medical Research Foundation of Oregon  
 Awarded 12/1999  
 William D. Mathers, M.D. Principle Investigator

Acanthamoeba Eye Infections     \$25,000  
 Collins Medical Trust  
 Awarded 7/00  
 William D. Mathers, M.D. Principle Investigator

**C. Other Financial Resources (other Grants and Contracts)**

Phase I Tolerance Study of a 0.15% Concentration     \$ 29,009  
 E7A (AF2975) in Normal Volunteers and in  
 Volunteers with "Dry Eye"  
 Angelini Pharmaceuticals, Inc, funded 1975  
 William D. Mathers, M.D., Principal Investigator

Bromhexine Treatment for Sjögrens Syndrome     \$ 40,500  
 Boehringer Ingelheim, funded 1991  
 William D. Mathers, M.D., Principal Investigator

Meibomian Gland Dysfunction and Contact Lens     \$ 10,000  
 Intolerance  
 Bausch & Lomb, funded 1990  
 William D. Mathers, M.D., Principal Investigator

Propamidine Use in Acanthamoeba Keratitis     \$ 2,000  
 Bausch & Lomb funded 1989  
 William D. Mathers, M.D., Co-Investigator

Penetrating Keratoplasty Collagen     \$ 2,600  
 Synthesis Analysis  
 Lions Eye Bank of Arizona, funded 1987

Efficacy of Temporary Punctal Occlusion     \$ 2,000  
 Lacrimedics, funded 1987

Dose Response of Epidermal Growth Factor     \$ 4,000  
 on Corneal Stromal Wounds - AMGEN,  
 funded 1987

Specular Epithelial Changes With a New  
Preservative: Polyquad - Alcon, funded 1986  
William D. Mathers, M.D., Principal Investigator \$ 4,000

Confocal Microscopy Grant Iowa Lions  
William D. Mathers, M.D., Principal Investigator \$ 40,000

Confocal Examination of Deposits After INTACTS  
Keravision Inc. funded 10/99  
William D. Mathers, M.D., Principal Investigator \$ 2,887

Dry Eye & Sjogren's syndrome  
Daiichi Pharmaceutical Corp. funded  
William D. Mathers, M.D., Co-Investigator

#### XIV. Bibliography

##### A. Papers Published or in Press

1. Sarnquist FH, **Mathers WD**, Brock-Utne J, Carr B, Canup C, Brown CR: A bioassay for a water-soluble Benzodiazepine against sodium thiopental. Anesthesiology 52:149-153, 1980.
2. **Mathers WD**, Grutzmacher RD: Lens implant calculations using an average of several formulas. CLAO Journal 12:216-218, 1986.
3. **Mathers WD**, Stevens G Jr., Rodrigues M, Chan CC, Gold J, Visvesvara GS, Lemp MA, Zimmerman LE: Immunopathology and electron microscopy of Acanthamoeba keratitis. American Journal of Ophthalmology 103:626-635, 1987.
4. **Mathers WD**: Occasional seizures that can follow retrobulbar anesthesia with bupivacaine 0.75%. Letter to the Editor. Annals of Ophthalmology 19:91, 1987.
5. **Mathers WD**: Cyanoacrylate adhesive application. Letter to the Editor. Ophthalmic Surgery 18:851, 1987.
6. **Mathers WD**, Lemp MA: Corneal rim cultures. Cornea 6:231-233, 1987.
7. **Mathers WD**, Kattan H, Earll J, Lemp M: Development of presenile cataracts in association with high serum levels of Phenytoin. Annals of Ophthalmology 19:291-292, 1987.
8. Fryczkowski AW, Sato SE, **Mathers WD**, Allinson RW, Sherman MD, Hodes BL: Architectonic structure of the blood vessels of the choroid. II. The submacular area. Klinika Oczna 90:5-8, 1988.
9. Fryczkowski AW, Sato SE, **Mathers WD**, Allinson RW, Sherman MD, Hodes BL: Angioarchitecture of the choroid. V. Peripheral choroid. The vortex veins. Klinika Oczna 90:81-86, 1988.
10. **Mathers WD**, Jester JV, Lemp MA: Return of human corneal sensitivity after penetrating keratoplasty. Archives of Ophthalmology 106:210-211, 1988.
11. **Mathers WD**, Sherman M, Fryczkowski A, Jester JV: Dose-dependent effects of epidermal growth factor on corneal wound healing. Investigative Ophthalmology & Visual Science 30:2403-2406, '89.
12. Lemp MA, **Mathers WD**, Gold JB: Surface cell morphology of the anesthetic human cornea: A color specular microscopic study. Acta Ophthalmologica Suppl (Copenh) 192:102-107, 1989.

13. Lemp MA, **Mathers WD**: Corneal epithelial cell movement in humans. Eye 3:438-445, 1989.
14. Mertz PH, Bouchard CS, **Mathers WD**, Goldman J, Shields WJ, Cavanagh HD: Corneal infiltrates associated with disposable extended wear soft contact lenses: A report of nine cases. CLAO Journal 16:269-272, 1990.
15. Horton JC, **Mathers WD**, Zimmerman LE: Pyogenic granuloma of the palpebral conjunctiva associated with contact lens wear. Cornea 9:359-361, 1990.
16. Lemp MA, **Mathers WD**, Sachdev MS: The effects of contact lens wear on the morphology of corneal surface cells in the human. Transactions of the American Ophthalmological Society 88:313-325, 1990.
17. **Mathers WD**, Lemp MA: Vortex keratopathy of the corneal graft. Cornea 10:93-99, 1991.
18. Bouchard CS, Chacko B, Cupples HP, Cavanagh HD, **Mathers WD**: Surgical treatment for a case of postoperative pseudallescheria boydii endophthalmitis. Ophthalmic Surgery 22:98-101, 1991.
19. **Mathers WD**, Gold JB, Kattan H, Lemp MA: Corneal steepening with final suture removal after penetrating keratoplasty. Cornea 10:221-223, 1991.
20. **Mathers WD**, Shields WJ, Sachdev MS, Petroll WM, Jester JV: Meibomian gland dysfunction in chronic blepharitis. Cornea 10:277-285, 1991.
21. **Mathers WD**, Shields WJ, Sachdev MS, Petroll WM, Jester JV: Meibomian gland morphology and tear osmolarity: Changes with Accutane therapy. Cornea 10:286-, 1991.
22. Lemp MA, **Mathers WD**: Renewal of the corneal surface. CLAO Journal 17:258-266, 1991.
23. **Mathers WD**, Sachdev MS, Petroll WM, Lemp MA: Morphologic changes in corneal epithelial cells with contact lens use. CLAO Journal 18:49-52, 1992.
24. **Mathers WD**, Lemp MA: Morphology and movement of corneal surface cells in humans. Current Eye Research 11:517-523, 1992.
25. Kletzky DL, Billbrough M, **Mathers WD**: Penetrating cornea wound size and endothelial cell loss. Ophthalmic Surgery 23(5):342-346, 1992.
26. **Mathers WD**, Billbrough M: Meibomian gland dysfunction and giant papillary conjunctivitis. American Jnl of Ophthal 14:188-192, 1992.
27. Nelson JD, Gordon J, the Chiron KCS-Study Group (**Mathers WD**): Topical fibronectin in the treatment of keratoconjunctivitis sicca (KCS). American Jnl of Ophthal 114:441-447, 1992.
28. **Mathers WD**, Binarao G, Petroll M: Ocular evaporation and the dry eye: A new measuring device. Cornea 12(4):335-340, 1993.
29. **Mathers WD**: Ocular evaporation in meibomian gland dysfunction and dry eye. Ophthalmology 100(3):347-351, 1993.
30. **Mathers WD**, Billbrough M.: Meibomian gland function and giant papillary conjunctivitis. American Journal of Ophthalmology 115:120, 1993.
31. Yu D, **Mathers WD**: Detection of varicella zoster virus in disciform keratitis using polymerase chain

- reaction. Arch of Ophthalmol 111:167-168, 1993.
32. Stone EM, **Mathers WD**, Rosenwasser GOD, Holland EJ, Folberg R, Krachmer JH, Nichols BE, Gorevic PD, Taylor CM, Streb LM, Fishbaugh JA, Daley TE, Sucheski BM, Sheffield VC: Three autosomal dominant corneal dystrophies map to chromosome 5q. Nature Genetics 6:47-51, 1994.
  33. **Mathers WD**, Daley T, Verdick R: Video imaging of the meibomian gland. Arch of Ophthalmol 112(4):448-449, 1994.
  34. Folberg R, Stone EM, Sheffield VC, **Mathers WD**: The relationship between granular, lattice type 1, and avellino corneal dystrophies. Arch of Ophthalmol 112:1080-1085, 1994.
  35. **Mathers WD**, Cavanagh HD: Tear film, pharmacology of eyedrops, and toxicity. Current Opinion in Ophthalmol 5(IV):13-18, 1994.
  36. **Mathers WD**, Daley T: In vivo observation of the tear film by tandem scanning confocal microscopy. Scanning 16:316-319, 1994.
  37. Mannor GE, **Mathers WD**, Wolfley DE, Martinez, JA: Hard palate mucosa graft in Stevens-Johnson syndrome. American Jnl of Ophthal 118(6):786-791, 1994.
  38. Winchester K, **Mathers WD**, Sutphin JE, Daley TE: Diagnosis of Acanthamoeba keratitis in vivo with confocal microscopy. Cornea 14(1):10-17, 1995.
  39. Rummelt V, Folberg R, Rummelt C, Palay DA, **Mathers WD**, Parys-van Ginderdeuren R, Krachmer JH, Yi H: Bilateral herpes simplex virus type 2 keratitis. German Journal of Ophthalmology 44:116-122, 1995.
  40. Heon E, **Mathers WD**, Alward WLM, Stone EM: Linkage of posterior polymorphous dystrophy to 20q11. Human Molecular Genetics 4(3):485-488, 1995.
  41. Mack RJ, Mason P, **Mathers WD**: Obstacles to donor eye procurement and their solutions at the University of Iowa. Cornea 14(3):249-252, 1995.
  42. **Mathers WD**, Petroll WM, Jester JV, Cavanagh HD: In vivo confocal microscopy: basic science and clinical applications. Current Opinion in Ophthalmology 6(IV):86-94, 1995.
  43. **Mathers WD**: Therapeutic contact lenses in eyelid and conjunctival disease. Contactologia 17 E:189-192, 1995.
  44. Goodman W, **Mathers WD**, Munden PM, Ossoinig KC, Daley TE: A study of aqueous humor dynamics in keratoconus. Exp Eye Res 62:95-99, 1996.
  45. **Mathers WD**, Sutphin JE, Folberg R, Meier PA, Wenzel RP, Elgin RG: Outbreak of keratitis presumed to be caused by Acanthamoeba. Am J Ophthmol 121:129-142, 1996.
  46. **Mathers WD**, Lane JA, Zimmerman MB: Model for ocular tear film function. Cornea 15(2):110-119, 1996.
  47. **Mathers WD**, Lane JA, Zimmerman MB: Tear film changes with normal aging. Cornea 15(3):229-235, 1996.
  48. **Mathers WD**, Daley TE: Tear flow and evaporation in patients with and without dry eye. Ophthalmology 103(4):664-669, 1996.

49. **Mathers WD**, Littlefield T, Lakes R, Lane JA, Daley T: Observation of the retina using tandem scanning confocal microscopy. Scanning 18:362-366,1996.
50. Winchester K, **Mathers WD**, Sutphin JE: Diagnosis of aspergillus keratitis in vivo with confocal microscopy. Cornea 16(1):27-31,1997.
51. Sutphin JE, Kantor AL, **Mathers WD**: Evaluation of crystalline keratitis with confocal microscopy in a case series. Cornea 16(1):21-26,1997.
52. **Mathers WD**, Lane JA, Zimmerman B: Assessment of the tear film using tandem scanning confocal microscopy. Cornea 16(2):162-168,1997.
53. **Mathers WD**, Goldberg MA, Sutphin JE, Ditzhoff JW, Folberg R: Coexistent Acanthamoeba Keratitis and Herpetic Keratitis. Arch of Ophthalmol 115: 714-718, June 1997.
54. Oh K, Weil LJ, **Mathers WD**, Corneal thickness in Fuchs' dystrophy with and without epithelial edema. Eye 12 (pt 2) : 282-4, 1998.
55. Meier PA, Wenzel RP, **Mathers WD**, Sutphin JE: Epidemic keratitis: Results of a case control investigation. Arch of Ophthalmol 116:1090-1094, 1998.
56. **Mathers WD**: Evaluating the tear film for contact lens wear. Refractive Eye Care for Ophthalmologists 2(4):1&42, July/August, 1998.
57. Meier PA, **Mathers WD**, Sutphin JE, Folberg R, Hwang T, Wenzel RP "An Epidemic of Presumed Acanthamoeba Keratitis that Followed Regional Flooding" Arch of Ophthal. 116: 1090-1094 Aug 1998
58. **Mathers WD**, Sutphin JE, Lane JA, Folberg R. "Correlation Between Surface Water Contamination with Amoeba and the Onset of Symptoms and Diagnosis of Amoeba-like Keratitis." British Journal of Ophthalmology. 82(10):1143-6, 1998 Oct.
59. **Mathers WD**, Stovall D, Lane JA, Zimmerman MB, Johnson S. "Menopause and tear function: the influence of prolactin and sex hormones on human tear production." Cornea. 17(4): 353-8, 1998 Jul.
60. Mathers WD Lane JA. "Meibomian Gland lipids, evaporation, and tear film stability." Advances in Experimental Medicine and Biology 438:349-60, 1998
61. Gardner LM, **Mathers WD**, Folberg R. New technique for the cytologic identification of presumed Acanthamoeba from corneal epithelial scrapings. Am J of Ophthalmology. 127(2):207-9, Feb 1999
62. Salomao DR, **Mathers WD**, Sutphin JE, Cuevas K, Folberg R. "Cytologic changes in the conjunctiva mimicking malignancy after topical mitomycin C." Ophthalmology 106(9):1756-60 discussion 1761, 1999 Sept
63. Kanis AB, Al-Rajhi AA, Taylor CM, **Mathers WD**, Folberg RY, Nishimura DY, Sheffield VC, Stone EM. Exclusion of AR-CHED from the chromosome 20 region containing the PPMD and AD-CHED loci. Ophthalmic Genetics. 20(4):243-9, 1999 Dec
64. **Mathers WD**, Nelson SE, Wilson, ME, Lane JL, Allen RA, Folberg R: Confirmation of Confocal Microscopy Diagnosis of Acanthamoeba Keratitis Using Polymerase Chain Reaction Analysis. Arch of Ophthal. 118:178-183, Feb. 2000

65. **Mathers WD**. "Confocal Examination of the Tear Film" Tear Film Journal of the Japan Contact Lens Society 2000
66. **Mathers, WD** "Why the Eye becomes Dry: A Corneal and Lacrimal Gland Feedback Model." CLAO Journal 26 (3):159-165 July 2000
67. **Mathers, WD**. "Measurement of the Tear Film" Contactologia 22 (3/4) 109-113 Oct. 2000
68. **Mathers WD, Dolney AM, Kraemer D**. "The effect of hormone replacement therapy on the symptoms and physiologic parameters of dry eye." Advances in Experimental Medicine and Biology 506(Pt B): 1017-22, 2002
69. **Mathers, WD, Choi, Dongseok**, "Cluster Analysis of Patients with Ocular Surface Disease, Blepharitis, and Dry Eye." Archives of Ophthalmol, June 2003. (in revision)
70. **Mathers, WD**, "Evaporation from the Ocular Surface." Experimental Eye Research. 2003. (in press)

#### **B. Books and/or Chapters/Other**

1. Lemp MA, **Mathers WD**: The corneal surface in keratoconjunctivitis sicca in the pre-ocular tear film. In: Health, Disease and Contact Lens Wear, Holly FJ (ed), Lubbock TX: Dry Eye Institute, 1986, pp 840-846.
2. **Mathers WD**, Lemp MA: The evolution of penetrating keratoplasty scarring and fibrosis. In: Transactions of the World Congress on the Cornea, III, 1987, pp 373-377. **Mathers WD**,
3. Lemp MA: The eye in endocrinology. In: Principles and Practices of Endocrinology, Becker KL (ed), Philadelphia: J B Lippincott, 1989.
4. **Mathers WD**, Lemp MA: Color specular microscopy. In: New Developments in Noninvasive Studies to Evaluate Ocular Function, New York: Springer-Verlag, 1990.
5. **Mathers WD**: Blepharitis in childhood. Chapter in: Decision Making in Pediatric Ophthalmology, St. Louis: CV Mosby, 1992.
6. Winchester K, **Mathers WD**: The eye in endocrinology. In: Principles and Practice of Endocrinology and Metabolism 2nd ed., Becker KL (ed), Philadelphia: J B Lippincott, 1994, pp 1793-1817.
7. **Mathers WD**: Examination of the Lids. In: Cornea, Krachmer J, Mannis M, Holland E (eds), St. Louis: Mosby, 1995.
8. **Mathers WD**, Stone MS: Seborrheic dermatitis in seborrheic blepharitis. In: Eye and Skin Disease, Mannis MJ, Macsai MS, and Huntley AC (eds), Philadelphia: Lippincott-Raven, 1995, pp 163-167.
9. Mack RJ, Mason P, **Mathers WD**: Obstacles to donor eye procurement and their solutions at the University of Iowa [Abstract]. Cornea. In: Year Book of Critical Care Medicine (the "Work"), Parillo, J, et al, (in press)
10. **Mathers WD**, Lane JA: Meibomian Gland Lipids, Evaporation, and Tear Film Stability. In: Lacrimal Gland, Tear Film, and Dry Eye Syndromes 2 Sullivan et al. (eds), New York: Plenum Press, 1998, pp 349-360.

11. **Mathers WD:** Confocal microscopy in the cornea. In: Corneal Surgery: Theory, Technique, and Tissue, 3rd edition, Brightbill FS (ed). May 1999
12. **Mathers WD:** Contributor to book: Fitting Guide for Rigid and Soft Contact Lenses, A Practical Approach, 4<sup>th</sup> edition.
13. **Mathers WD:** Confocal Microscopy and Acanthamoeba Infection. Refractive Eye Care for Ophthalmologists, Volume 6, Number 10, October 2002
14. **Mathers, WD, Dolney, AM, Kraemer, D:** The Effect of Hormone Replacement Therapy on the Symptoms and Physiologic Parameters of Dry Eye.
15. **Mathers, WD, Krachmer, J., Mannis, M., Holland, E:** Examination of the Lids Cornea 2<sup>nd</sup> Edition, August 2003
16. **Mathers, WD:** Meibomian Gland Disease, Chapter 12, Contributor to book: Dry Eye and the Ocular Surface-A Unified Approach . September 2003.

#### C. Web Publications

1. Mathers WD "Clinical Protocol on Conjunctivitis" for WebEBM inc. at [www.webebm.com](http://www.webebm.com) Nov.'00

#### D. Abstracts

1. **Mathers WD, Stevens G, Rodrigues M, Gold J, Zimmerman L, Lemp MA:** Acanthamoeba keratitis immunologic response. Ocular Microbiology and Immunology Group Annual Meeting, 1986.
2. Gold JB, **Mathers WD, Lemp MA:** The effects of topical sodium hyaluronate on specular microscopic changes in the corneal epithelium of human subjects with KCS. Invest Ophthalmol Vis Sci Suppl 27:27, 1986.
3. **Mathers WD, Lemp MA:** Analysis of positive cultures from donor sclera. Eye Bank Association Annual Meeting, 1986.
4. **Mathers WD, Lemp MA:** Color specular microscopic analysis of the surface of the corneal graft. CLAO National Meeting, 1987.
5. Fryczkowski AW, Sato SE, Simons KB, **Mathers WD, Allinson RW, Sherman MD, Hodes BL:** Changes in the diabetic choroid. Invest Ophthalmol Vis Sci Suppl 28:123, 1987.
6. Sherman MD, Fryczkowski AW, Sato SE, Allison RW, **Mathers WD, Simons KB, Hodes BL:** Scanning electron microscopy of human ocular vascular casts. Angioarchitecture at the posterior pole. Invest Ophthalmol Vis Sci Suppl 28:260, 1987.
7. **Mathers WD, Jester JV, Lemp MA:** Return of human corneal sensitivity after penetrating keratoplasty. Invest Ophthalmol Vis Sci Suppl 28:228, 1987.
8. **Mathers WD, Jester JV:** Full thickness corneal wound strength enhancement by epidermal growth factor. Invest Ophthalmol Vis Sci Suppl 29:312, 1988.



9. **Mathers WD**, Lemp MA, Jester JV, Cavanagh HD: Color specular microscopy of the corneal epithelium in humans. In: Proceedings of the International Society for Eye Research 5:132, '88
10. **Mathers WD**, Cavanagh HD, Jester JV, Lemp MA: In vivo confocal microscopy of the eye. In: Proceedings of the International Society for Eye Research 5:133, 1988.
11. **Mathers WD**, Jester JV, Cavanagh HD, Lemp MA: In vivo cell responses to injury using confocal microscopy. In: Proceedings of the International Society for Eye Research 5:133, 198
12. **Mathers WD**, Lemp MA: The distribution of surface epithelial cells by size on the human cornea. Invest Ophthalmol Vis Sci Suppl 30:519, 1989.
13. **Mathers WD**, Lemp MA: Quantitative ocular surface renewal using specular microscopy. The Castroviejo Cornea Society Annual Meeting, 1989.
14. **Mathers WD**, Shields WJ, Sachdev MS, Najafian F, Jester JV: Morphologic changes in meibomian glands with Accutane use in human. Invest Ophthalmol Vis Sci Suppl 31:559, 1990.
15. Shields WJ, **Mathers WD**, Roberts J, Sachdev MS, Jester JV: Criteria for the evaluation of lid margin in blepharitis. Invest Ophthalmol Vis Sci Suppl 31:483, 1990.
16. **Mathers WD**, Shields WJ, Sachdev MS, Jester JV: A methodology for evaluation of meibomian gland dysfunction in the human. In: Proceedings of the International Society for Eye Research 6:202, 1990.
17. Sachdev MS, Jester JV, **Mathers WD**: Morphologic changes in meibomian glands with Accutane use in humans. In: Proceedings of the Second Congress of the International Society of Ocular Toxicity, page 25, 1990.
18. **Mathers WD**, Jester JV, Shields WJ: Differentiation of chronic blepharitis by meibomian function: A new classification. Ophthalmology 97:138, 1990.
19. Kletzky DL, Billbrough M, Parver L, **Mathers WD**: Correlation of penetrating corneal wound size with endothelial cell loss. Invest Ophthalmol Vis Sci Suppl 32:1066, 1991.
20. Shields WJ, Street DA, Jester JV, Petroll WM, **Mathers WD**: Comparison of meibography versus clinical examination in detecting meibomian gland dysfunction (MGD) in chronic blepharitis. Invest Ophthalmol Vis Sci Suppl 32:1170, 1991.
21. **Mathers WD**, Shields WJ, Petroll WM, Jester JV: Cluster analysis of meibomian gland dysfunction parameters in patients with chronic blepharitis. Invest Ophthalmol Vis Sci Suppl 32:682, 1991.
22. Lemp MA, Shields WJ, Essepian JP, **Mathers WD**: The clinical use of tandem scanning confocal microscopy of the cornea. Invest Ophthalmol Vis Sci Suppl 33(4):1234, 1992.
23. Essepian JP, Yu DD, **Mathers WD**: The effect of non-steroidal anti-inflammatory drugs (NSAIDs) on corneal wound healing. Invest Ophthalmol Vis Sci Suppl 33(4):890, 1992.
24. Mannor GE, Shin G, Wolfley DE, **Mathers WD**: Hard palate mucosa graft in autoimmune corneal and conjunctival disease. Invest Ophthalmol Vis Sci Suppl 33 (4):1240, 1992.
25. Martinez JA, Lemp MA, **Mathers WD**: Effects of orbicularis induced pressure on corneal topography. Invest Ophthalmol Vis Sci Suppl 33(4):1303, 1992.

26. Yu DD, **Mathers WD**, Lemp MA: DNA polymerase chain reaction demonstrates varicella zoster sequence in stromal keratitis. Invest Ophthalmol Vis Sci Suppl 33(4):976, 1992.
27. Hendricks CA, **Mathers WD**: Results of Scleral Fixated Intraocular Lenses with Patients with Disrupted Anterior Segments. Invest Ophthalmol Vis Sci Suppl 33(4):1303, 1992.
28. **Mathers WD**, Petroll W: Increased Evaporation from the Ocular Surface with Meibomian Gland Dysfunction and Gland Drop-out. Ophthalmol Suppl 99:126, 1992
29. Essepian JP, Neu K, **Mathers WD**, Antonocci RK, Rajpal RK: The effect of Diclofenac, a non-steroidal anti-inflammatory drug NSAID, on corneal wound healing. Invest Ophthalmol Vis Sci Suppl 34:1321, 1993.
30. **Mathers WD**, Rummelt V, Folberg R, Rummelt C, Krachmer JH, Ginderdeuren P: Bilateral Neonatal Progressive Herpes Simplex Virus Type II (HSV-2) Keratitis. Invest Ophthalmol Vis Sci Suppl 34:1090, 1993.
31. **Mathers WD**, Daley T: Evaporation and tear flow in lacrimal insufficiency. Invest Ophthalmol Vis Sci Suppl 35: 1487, 1994.
32. Daley T, **Mathers WD**: In vivo observations of the human tear film using tandem scanning confocal microscopy. Invest Ophthalmol Vis Sci 35:1488, 1994.
33. Goodman WT, **Mathers WD**, Munden PM, Ossoinig KC, Daley TE: A study of aqueous humor dynamics in keratoconus. Invest Ophthalmol Vis Sci Suppl 35:486, 1994.
34. Winchester K, **Mathers WD**, Sutphin JE, Daley T: Diagnosis of acanthamoeba keratitis in vivo using confocal microscopy. Invest Ophthalmol Vis Sci Suppl 35:1937, 1994.
35. Weil LJ, **Mathers WD**, Daley T, Zimmerman MB: Corneal thickness in Fuchs' dystrophy with and without epithelial edema. Invest Ophthalmol Vis Sci Suppl 35:1587, 1994.
36. Folberg R, Stone EM, **Mathers WD**, Sheffield VC: The relationship between granular, lattice type I, and avellino corneal dystrophies. Invest Ophthalmol Vis Sci Suppl 35:1447, 1994.
37. Elgin RG, **Mathers WD**, Sutphin JE: The Epidemiology, clinical features, value of confocal microscopy and treatment response of 30 cases of Acanthamoeba keratitis diagnosed from 1993 to 1994. Invest Ophthalmol Vis Sci 36(4):S182, 1995.
38. Littlefield T, **Mathers WD**, Daley TE, Lakes R: Tandem scanning confocal microscopy of the rabbit retina in vivo. Ophthalmol Vis Sci 36(4):S239, 1995.
39. Kanis AB, **Mathers WD**, Holland EJ, Rosenwasser GOD, Rosa N, Kim W, Proud V, Lam B, Sheffield VC, Stone EM: Invest Ophthalmol Vis Sci 36(4):S771, 1995.
40. Héon E, **Mathers WD**, Alward WLM, Weisenthal RW, Sunden SLF, Fishbaugh J, Taylor CM, Krachmer JH, Sheffield VC, Stone EM: Linkage analysis of posterior polymorphous corneal dystrophy and assessment of genetic heterogeneity. Invest Ophthalmol Vis Sci 36(4):S771, 1995.
41. Sutphin JE, Elgin RG, **Mathers WD**, Winchester K: Confocal microscopy of infectious crystalline keratitis: a case series. Invest Ophthalmol Vis Sci 36(4):S1022, 1995.
42. Winchester K, Elgin RG, **Mathers WD**, Sutphin JE: Confocal microscopy of fungal keratitis. Invest Ophthalmol Vis Sci 36(4):S1022, 1995.

43. **Mathers WD**, Lane J: The effect of age on tear flow measurements and meibomian gland function. Invest Ophthalmol Vis Sci 36(4):S1042, 1995.
44. Lane J, Zimmerman B, **Mathers WD**, Daley TE: A physiologic model of tear film function. Invest Ophthalmol Vis Sci 36(4):S1042, 1995.
45. Kantor AL, Sutphin JE, Stone EM, Folberg R, **Mathers WD**: Acanthamoeba keratitis: Epidemiology, detection and treatment results of a large series. Invest Ophthalmol Vis Sci 37(3):S703, 1996.
46. Lane JA, **Mathers WD**: The effect of digital expression of the meibomian glands on the lipid layer of the tear film and evaporation rate. Invest Ophthalmol Vis Sci 37(3):S850, 1996.
47. **Mathers WD**, Lane JA, Zimmerman MB: The physiological assessment of the human tear film using confocal microscopy and its correlation with ocular pathology. Invest Ophthalmol Vis Sci 37(3):S850, '96
48. Sutphin JE, **Mathers WD**, Lane JA: Tear function following photorefractive keratoplasty with solid state laser. Invest Ophthalmol Vis Sci 37(3):S850, 1996.
49. **Mathers WD**, Lane JA, Zimmerman B, Stovall D, Sutphin JE: Hormone influence on tear function: The role of prolactin, testosterone, estrogen and FSH after menopause. Invest Ophthalmol Vis Sci 38(4):S212, 1997.
50. Lane JA, **Mathers WD**, Sutphin JE, Folberg R: Variation in cases per month of Acanthamoeba, a waterborne pathogen. Invest Ophthalmol Vis Sci 38(4):S424, 1997.
51. Kim KS, **Mathers WD**, Alexandrakis G, Sutphin JE, Wiles CD: Polymerase chain reaction for Acanthamoeba keratitis, primers selection and inhibitory factors. Invest Ophthalmol Vis Sci 38(4):S1073, 1997.
52. Mayberry M, Zimmerman MB, **Mathers WD**, Sutphin JE: Detection of keratoconus using Orbscan scanning slit topography. Invest Ophthalmol Vis Sci 38(4):S920, 1997.
53. DeWild L, **Mathers WD**, Lane J, Sutphin JE, Folberg R: Confocal microscopic and histopathologic verification of acanthamoeba keratitis in a rabbit animal model. Invest Ophthalmol Vis Sci 39(4):S146, 1998.
54. Lane JA, **Mathers WD**: The effect of single lower lid punctal occlusion on human tear production and the pre-corneal tear film. Invest Ophthalmol Vis Sci 39(4):S533, 1998.
55. **Mathers WD**, Lane J: Tear function in women following ovariectomy and hormone replacement compared with age matched women. Invest Ophthalmol Vis Sci 39(4):S540, 1998.
56. Cuevas KH, **Mathers WD**, Sutphin JE, Folberg R: Topical mitomycin C for the treatment of primary acquired melanosis and malignant melanoma of the conjunctiva. Invest Ophthalmol Vis Sci 39(4):S542, 1998.
57. Gardner LM, **Mathers WD**, Sutphin JE, Folberg R: New technique for the cytologic identification of acanthamoeba organisms from corneal epithelial scraping. Invest Ophthalmol Vis Sci 39(4):S545, 1998.
58. Bordewick DL, Brown J Jr, **Mathers WD**, Sutphin JE, Goeken N, Wollenzien J: The clinical significance of HLA (human leukocyte antigen) antibodies in high risk corneal transplantation. Invest Ophthalmol Vis Sci 39(4):S2067, 1998

59. **Mathers WD**, Nelson SE., Folberg R: "Confirmation of Confocal Microscopy Diagnosis of Acanthamoeba Keratitis Using Polymerase Chain Reaction Analysis" Invest. Ophthalm. and Vis Sci. 40 (4): S263, 1999
60. **Mathers WD**, Lane, JA: "The relationship between Sex Hormone levels and Tear Function in Women with Sjogren's Syndrome" Invest. Ophthalm. and Vis Sci. 40 (4): S555, 1999
61. Burris T, Holmes-Higgins D, Dolney AM, Hobb SR, **Mathers WD**: "In Vivo Confocal Microscopy of Lamellar Channel Deposits Observed with INTACTS™ for Myopia" Invest. Ophthalm. and Vis Sci 41 (4): 4877-B824 2000
62. **Mathers WD**, Dolney AM "Objective Demonstration of Tear Stimulation with Oral Pilocarpine in Dry Eye Patients" Invest. Ophthalm. and Vis Sci 41 (4): 312-B312 2000
63. **Mathers WD**, Dolney AM, Kraemer D "The Effect of Hormone Replacement Therapy on the Symptoms and Physiologic Parameters of Dry Eye"
64. **Mathers WD**, Dolney AM, Kraemer D "Physiological Definition Of Obstructive Seborrhic Meibomian Gland Dysfunction And Dry-Eye Analysis of 513 Patients" Invest. Ophthalm. and Vis Sci 42 (4): 4742-B761 2001
65. Dolney AM, **Mathers WD**, Kraemer D "The Effect Of Hormone Replacement Therapy {HRT} On Dry Eye Symptoms and Physiologically Defined Dry Eye" Invest. Ophthalm. and Vis Sci 42 (4): 176-B149 2001
66. **Mathers WD**, Dolney AM, Kraemer D. "Effect on Dry Eye of Hormone Replacement Therapy (HRT) for Women Prior to and during Menopause. Cornea 19 (suppl 2):S104,2001
67. Shine WE, **Mathers WD**, McCulley JP. "Association of Monoglyceride nonpolar lipids with Dry Eye Signs in Blepharitis Patients" Invest Ophthalm and Vis Sci (submitted 2002)
68. **Mathers WD**, Planck, SR, Dolney, A.-M, "Gene Expression in the Lacrimal Gland in Response to Corneal Trauma of the Mouse Eye"ARVO May 2002, 3129-B113
69. LT Dudek, TH Nguyen, DE Kurz, P Maticco, **WD Mathers**, JT Rosenbaum, "The View From Within: In Vivo Confocal Microscopy of Leukocyte-Endothelial Dynamics in Patients with Uveitis or Scleritis." ARVO May 2003, 994.
70. **Mathers WD**, Dolney A, "Long Term Changes in Lacrimal Gland Gene Expression Following Corneal Trauma". ARVO May 2003, 2524.
71. Nguyen T, Dudek LT, Krisciunas TC, Maticco P, **Mathers WD**, Rosenbaum JT, "Possible Increased Leukocyte Adhesion in Patients who Wear Overwear Soft Contact Lenses with Lower Dk Values." ARVO May 2003, 3796.
72. Hannan TA, **Mathers WD**, "Acanthamoeba Sensitivity Testing Results for Various Amoebicidal Medications and Concentrations." ARVO May 2003, 4766.

## Presentations

### 1978

- Sarnquist FH, **Mathers WD**, Brown CR: "Clinical comparison of medazolam maleate with thiopental as anesthetic induction agents." American Society of Anesthesiologists, October 1978.

### 1985

- **Mathers WD**: "Update on anesthetics in ophthalmology." Update on Ocular Therapeutics, (at Georgetown University) Georgetown University Center for Sight, Washington DC, November 23, 1985.

### 1986

- Gold JB, **Mathers WD**, Lemp MA: "The effects of optical sodium hyaluronate on specular microscopic changes in the corneal epithelium of human subjects with KCS." Poster presented at Association for Research in Vision and Ophthalmology, Sarasota FL, April 1986.
- **Mathers WD**: "Corneal physiology." 7th Annual Review Course for Ophthalmic Technicians, Georgetown University, Washington DC, May 1986.
- **Mathers WD**, Stevens G: "Acanthamoeba keratitis immunologic response." Ocular Microbiology and Immunology Annual Meeting, November 8, 1986.
- **Mathers WD**, Lemp MA: "Corneal rim cultures." Eye Bank Association Annual Meeting, November 8, 1986.

### 1987

- **Mathers WD**, Lemp MA: "Color specular microscopic analysis of the surface of the corneal graft." Poster presented at CLAO Annual Meeting, January 1987 (First Prize).
- **Mathers WD**, Lemp MA: "The evolution of scarring and fibrosis following penetrating keratoplasty." World Congress on the Cornea, Washington DC, April 1987.
- Lemp MA, **Mathers WD**: "Diseases of ocular surface: Diagnosis and management." Course presented at American Academy of Ophthalmology, Dallas TX, November 1987.

### 1988

- **Mathers WD**, Jester JV: "Full thickness corneal wound strength enhancement by epidermal growth factor." Poster presented at Association for Research in Vision and Ophthalmology, Sarasota FL, April 1988.
- **Mathers WD**: "Clinical implications of ocular pharmacology." Association of Hospital Based Pharmacists, Washington DC, May 1988.

- **Mathers WD:** "Preoperative assessment of the cataract patient", and "Postoperative inflammation - Infection or sterile?" Ophthalmology Continuing Medical Education Program - The New Techniques in Anterior Segment Surgery: The Cutting Edge, Georgetown University, Washington DC, June 9-10, 1988.
- Cavanagh HD, Jester JV, **Mathers WD**, Lemp MA: "In vivo confocal microscopy of the eye." 8th International Congress of Eye Research, San Francisco CA, September 1988.
- Lemp MA, **Mathers WD**, Jester JV, Cavanagh HD: "Color specular microscopy of the corneal epithelium in humans." 8th International Congress of Eye Research, San Francisco CA, September 1988.
- Jester JV, Cavanagh HD, **Mathers WD**, Lemp MA: "'In vivo' cell responses to injury using confocal microscopy." 8th International Congress of Eye Research, San Francisco CA, September 1988.
- **Mathers WD**, Lemp MA, Cavanagh HD: "Corneal epithelial morphology of contact lens wearers." International Society for Contact Lens Research, Koloa, Kanai HI, August 31-September 3, 1988.
- Cavanagh HD, Jester JV, **Mathers WD**, Dilly PN, Lemp MA: "Real time in vivo corneal cellular morphology: Confocal tandem scanning microscopy." International Society for Contact Lens Research, Koloa, Kanai HI, August 31-September 3, 1988.
- **Mathers WD:** "Non-perforating eye injuries: Corneal abrasions and foreign bodies", and "Ocular history and physical examination." Ophthalmology Workshop for the Emergency Physician, Program Director. Georgetown University, Washington DC, September 17, 1988.
- Lemp MA, **Mathers WD**, Cavanagh HD: "Ocular surface disease: Pathogenesis and management." Course presented at American Academy of Ophthalmology, Las Vegas NV, October 12, 1988.
- **Mathers WD:** "Ocular allergy and contact lens-induced GPC." Center for Sight/Fall Symposium - Recent Advances in Immunopathologic Diseases of the Eye. Georgetown University, Washington DC, October 19, 1988.
- **Mathers WD:** "Specular microscopy and methods of office corneal examination." Greenbrier Postgraduate Course: Office-Based Ophthalmology, White Sulphur Springs WV, October 21-22, 1988.

## 1989

- **Mathers WD:** "The effect of contact lenses on the eyelids," and "Changes in the ocular surface with contact lens wear." CLAO Annual Meeting, New Orleans LA, January 19, 1989.
- **Mathers WD:** "Primary anterior segment repair in ocular trauma." Spring Clinical Conference: Comprehensive Management of the Ocular Trauma Patient. Georgetown University, Washington DC, March 11, 1989.
- **Mathers WD:** "The treatment of blepharitis." Washington Ophthalmological Society, March 21, 1989.

- **Mathers WD:** "Ophthalmic history taking." 10th Annual Review Course and Continuing Education Program for Ophthalmic Medical Personnel. Georgetown University, Washington DC, May 11-13, 1989.
- Visiting Professor, Medical College of Virginia, Richmond VA, May 1989.
- **Mathers WD:** "Blepharitis: New approaches to an old problem." 27th Annual Residents Day and Alumni Conference, Georgetown University, Washington DC, June 10, 1989.
- **Mathers WD:** "External disease lecture." 23rd Annual Washington DC Post-Graduate Course in Ophthalmology, July 24-25, 1989.
- **Mathers WD:** "Lid effects on the ocular surface." American Academy of Ophthalmology, New Orleans LA, October 30, 1989.
- Lemp MA, **Mathers WD:** "Ocular surface disease: Pathogenesis and management." American Academy of Ophthalmology, New Orleans LA, November 1, 1989.
- **Mathers WD:** "Infections, contact lenses, and the eye: Recent successes and controversies." Fall Clinical Conference, Course Director. Georgetown University, Washington DC, November 4, 1989.

#### 1990

- **Mathers WD:** "Blepharitis concepts." Washington Ophthalmic Society, January 30, 1990.
- **Mathers WD:** "Confocal microscopy of the human eye." Contact Lens Symposium, International Congress of Ophthalmology, Singapore, May 1990.
- **Mathers WD, Shields WJ, Sachdev M, Jester JV:** "Meibomian gland dysfunction and chronic blepharitis." Castroviejo Society, May 1990.
- Visiting Professor, University of Western Australia, Perth, Australia, May 1990.

#### **E. Other: Exhibits, Films, Tapes, Special Presentations Cont..**

- **Mathers WD:** "Meibomian gland morphology and function in chronic blepharitis." 28th Annual Residents and Alumni Conference, Georgetown University, Washington DC, June 1990.
- **Mathers WD:** "Eyelid disease and meibomian gland dysfunction", and "Eyelid disease and ocular surface defects." The Greenbrier Course, White Sulfur Springs WV, October 1990.
- **Mathers WD:** "Variations in surface cell morphology with different types of contact lenses." Institute for Contact Lens Research, Monte Carlo, 1990.
- Visiting Professor, University of Connecticut, Hartford CT, December 1990.

## 1991

- **Mathers WD, Sachdev M:** "Ocular effects of Accutane use in humans" and "The objective analysis of meibomian gland function in blepharitis." All India Ophthalmological Society, Bangalore, India, January 1991.
- **Mathers WD:** "Lid disease and dry eye." Sjögren Society Meeting, Washington DC, April 1991.
- **Mathers WD:** "Meibomian gland dysfunction and its role in maintaining tear osmolarity in chronic blepharitis." Virginia Society of Ophthalmology, Reston, VA, May 1991.
- **Mathers WD:** "History taking." 12th Annual Review Course and Continuing Education Program for Ophthalmic Medical Personnel, Georgetown University, Washington DC, May 1991.
- **Mathers WD:** "Corneal astigmatism following cataract surgery: Control and prevention." Maryland Society of Eye Physicians and Surgeons, Baltimore MD, September 1991.
- Visiting Professor, Val de Grace Hospital, Paris, France, September 1991.
- **Mathers WD:** "Skin and mucous membrane disease." American Academy of Ophthalmology, October 1991.
- **Mathers WD:** "Eyelid, Cornea and Tear Physiology Related to Contact Lens," "Solutions,
- **Mathers WD :** Care Regimens, Patient Education and Follow-Up," "Therapeutic Contact Lenses." CLAO Regional Basic Contact Lens Seminar, Dallas, TX, November 1991.

## 1992

- **Mathers WD:** "Meibomian gland dysfunction and giant papillary conjunctivitis." CLAO Annual Meeting, Las Vegas NV, January 1992.
- **Mathers WD:** "Meibomian gland dysfunction and the sebaceous gland analogy." Iowa Dermatologic Society Meeting, Iowa City, Iowa, September 19, 1992.
- **Mathers WD:** "DK and Corneal Hypoxia." Iowa Optometry Meeting, October 1992.
- **Mathers WD:** "Patient Compliance: Will They or Won't They?" American Academy of Ophthalmology, November 1992.

## 1993

- **Mathers WD:** "The Red Eye." Refresher Course for Family Physicians, Department of Family Practice, University of Iowa Hospital, March 1993.
- **Mathers WD:** "DK and Corneal Hypoxia." Iowa Optometric Association, October 1993.



- **Mathers WD:** "Imaging of the Cornea." American Academy of Ophthalmology, 1993.
- **Mathers WD:** "Confocal Imaging of Acanthamoeba Keratitis." Ocular Microbiology and Immunology Group, American Academy of Ophthalmology, November 1993.
- **Mathers WD:** "The Interaction of the Contact Lens and the Tear Film: Wichterle's Days of Contact Lens." Prague, Czechoslovakia, October 1993.

#### 1994

- **Mathers WD:** "Evaporation from the Contact Lens Surface." Las Vegas, Nevada, January 1994.
- **Mathers WD:** "Imaging the Cornea and the Contact Lens." Contact Lens Society of America Meeting, Phoenix, Arizona, March 1994.
- **Mathers WD:** "Tear Film Evaporation and the Contacts Lens." Touhy Lectureship, Contact Lens Society of America Meeting, March 1994.
- **Mathers WD:** "Evaporation and Tear Film in Lacrimal Insufficiency." ARVO, May 1994
- **Mathers WD:** "Confocal Microscopy in Ophthalmology," and "Meibomian Gland Dysfunction and the Dry Eye." Resident Alumni Day Guest Speaker, Department of Ophthalmology, University of Washington, Seattle, June 1994.
- **Mathers WD:** "Blepharitis and Meibomian Gland Dysfunction." Iowa Eye, June 1994.
- **Mathers WD:** "Evaporation from the Contact Lens." International Congress of Ophthalmology, Toronto, June 1994.
- **Mathers WD:** Contacts lenses and Acanthamoeba infections, ECLSO, Alicante, Spain, September 1994.

#### 1995

- **Mathers WD:** Corneal Physiology Symposium: Corneal Epithelium in Health and Disease, "The Adnexa, the Tears and the Epithelium: A Story of Close Quarters and Toxic Waste." Contact Lens Society of America Annual Meeting, Los Vegas, Nevada, January, 1995.
- **Mathers WD:** Castroviejo Society Symposium: Imaging the Anterior Segment, "Confocal Microscopy I: Optics and Clinical Indications." Contact Lens Society of America Annual Meeting, Los Vegas, Nevada, January, 1995.
- **Mathers WD, Nelson JD:** Anatomy & Pathology/Cornea, "Diagnosis of the Dry Eye." Moderators at Association for Research in Vision and Ophthalmology, Ft. Lauderdale, May 1995.
- **Sutphin JE, Elgin RG, Mathers WD, Winchester K:** "Confocal microscopy of infectious crystalline keratitis: a case study." Poster presented at Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida, May 1995.

- **Mathers WD:** "Confocal Microscopy: The New Paradigm for Corneal Disease." Simpósio Internacional de Lentes de Contato e Córnea (International Symposium on Cornea and Contact Lens), Goiânia, Brazil, May 1995.
- **Mathers WD:** "Contact Lenses and Evaporation from the Ocular Surface." Simpósio Internacional de Lentes de Contato e Córnea (Intl Symposium on Cornea and Contact Lens), Goiânia, Brazil, May
- **Mathers WD:** "Dry Eye and Its Causes." Simpósio Internacional de Lentes de Contato e Córnea (International Symposium on Cornea and Contact Lens), Goiânia, Brazil, May 1995.
- **Mathers WD, Sutphin JE, Elgin R, Folberg R:** "The Iowa Epidemic: Unmasking Acanthamoeba Keratitis." The Annual Iowa Meeting, Iowa City, IA, May 1995.
- **Mathers WD, Lane J:** "The Effect of Age on Tear Flow Measurements and Meibomian Gland Function." The Association for Research in Vision and Ophthalmology, Ft. Lauderdale, Florida, May 1995.
- **Mathers WD:** "Acanthamoeba Keratitis and the Contact Lens." XXV Congress of the ECLSO, Clermont-Ferrand, France, September 1995.
- **Mathers WD:** "Blepharitis and the Dry Eye." Joint Commission on Allied Health Personnel In Ophthalmology, Atlanta, GA, October 1995.
- **Brown J, Mathers WD, Sutphin JE:** "Oral Cyclosporin for High Risk Cornea Transplants." Poster presentation, American Academy of Ophthalmology Meeting, Atlanta, GA, 1995.

#### 1996

- **Mathers WD:** "A New Model for Tear Film Function in Meibomian Gland Dysfunction, Dry Eye and Normal Eyes." 1996 CLAO Annual Meeting, Las Vegas, Nevada, Feb. 3, 1996.
- **Mathers WD:** "Confocal Microscopy of the Human Tear Film." 1996 CLAO Annual Meeting, Las Vegas, Nevada, Feb. 1, 1996.
- **Mathers WD:** "Confocal Images of the Human Tear Film and Their Correlation with Tear Function." World Congress on the Cornea IV, Orlando, Florida, April 17, 1996.
- **Lane JA, Mathers WD:** "The Effect of Digital Expression of the Meibomian Glands on the Lipid Layer of the Tear Film and Evaporation rate." Poster presentation, 1996 Association for Research and Vision in Ophthalmology Annual Meeting, Ft. Lauderdale, Florida, May, 1996.
- **Mathers WD, Lane JA, Zimmerman MB:** "The Physiological Assessment of the Human Tear Film Using Confocal Microscopy and Its Correlation with Ocular Pathology." Poster presentation, 1996 Association for Research in Vision and Ophthalmology Annual Meeting, Ft. Lauderdale, Florida, May, 1996.
- **Mathers WD:** "Advances in Diagnosis and Treatment of Corneal Transplant Rejection" presented at the XII Brazilian Congress of Ophthalmology Prevention of Blindness Meeting, Sao Paulo, Brazil, September, 1996.

- **Mathers WD:** "Tear Film and Lacrimal Gland Function and Contact Lenses" presented at the XII Brazilian Congress of Ophthalmology Prevention of Blindness Meeting, Sao Paulo, Brazil, September, 1996.
- **Mathers WD:** "Complications of Contact Lenses" presented at the XII Brazilian Congress of Ophthalmology Prevention of Blindness Meeting, Sao Paulo, Brazil, September, 1996.
- **Mathers WD:** "A Look into the Future of Cornea" presented at the Iowa Eye Association Alumni Meeting, Iowa City, Iowa, September 19, 1996.
- **Mathers WD:** "Alternative Ophthalmic Imaging" presented at the Ophthalmic Photographers' Society 27th Annual Educational Program, Chicago, October, 1996.
- **Mathers WD:** Discussant: Manuscript "Instant Diagnosis of Bacterial, Fungal, Amoebic and HSV Keratitis with the White Light Confocal Microscope" submitted by Dr. Stephen Charles Kaufman, American Academy of Ophthalmology Annual Meeting, Chicago, October, 1996.
- **Mathers WD:** "Ocular Infections and Cellulitis" presented at the Clinical Lecture Series for Family Practice Residents and Faculty, Iowa City, Iowa, November 6, 1996.
- **Mathers WD:** "Lacrimal Gland, Tear Film, and Dry Eye Syndrome" presented as keynote address at the Second International Congress on Lacrimal Gland, Tear Film, and Dry Eye Syndromes: Basic Science and Clinical Relevance, Southampton Parish, Bermuda, November, 1996.

#### 1997

- **Mathers WD:** "Confocal Microscopy of *Acanthamoeba* Keratitis: Human and Animal Studies" presented at the Contact Lens Association of Ophthalmologists annual meeting, Las Vegas, January, 1997.
- **Mathers WD:** "The Dry Eye and Contact Lenses, Therapeutic Contact Lenses" presented at the Contact Lens Association of Ophthalmologists, XXI Pan American Congress, Cancun, Mexico, May, 1997.
- **Mathers WD:** "Confocal Microscopy: In Pursuit of Resolution" dialogue with Drs. James D. Auran, Charles J. Koester, Raine K. Mustonen, Marguerite B. McDonald reprinted in Eye World 2(5):14-17, May 1997.
- **Mathers WD:** "Considerations in Astigmatism after PKP" presented at the Iowa Eye Association Alumni meeting, Iowa City, Iowa, June, 1997.
- **Mathers WD:** "Complications of Contact Lens Wear" presented at the Japan Contact Lens Society 40th Annual Meeting, Osaka, Japan, June, 1997.

#### 1998

- **Mathers WD:** Invited Lecture as Visiting Professor at University of Oregon, Portland, February, 1998.

- **Mathers WD**, Folberg R, Sutphin JE, Allen R, Stone E, Wilson M: "Acanthamoeba Keratitis: New Approaches to Diagnosis." Poster presentation at the XXVIII International Congress of Ophthalmology, Amsterdam, June, 1998.
- **Mathers WD**: "Introduction: Confocal Microscopy in the Eye--Applications." presented at the XIII International Congress of Eye Research, Paris France, July, 1998.
- **Mathers WD**: "Current Limitation to the Resolution of Confocal Microscopy." presented at the XIII International Congress of Eye Research, Paris France, July, 1998.
- **Mathers WD**: "Technical Aspects of In Vivo Confocal Image Capture." Poster presentation at the XIII International Congress of Eye Research, Paris France, July, 1998.
- **Mathers WD**: "Status of Acanthamoeba Detection with Confocal Microscopy." Poster presentation at the XIII International Congress of Eye Research, Paris France, July, 1998.
- Salomao DR, **Mathers WD**, Sutphin JE, Cuevas KH, Folberg R: "Cytologic Changes in the Conjunctiva Mimicking Malignancy After Topical Mitomycin-C Chemotherapy." platform presentation at the American Academy of Ophthalmology annual meeting in New Orleans, November, 1998.

## 1999

- **Mathers WD**, Nelson SE., Folberg R: "Confirmation of Confocal Microscopy Diagnosis of Acanthamoeba Keratitis Using Polymerase Chain Reaction Analysis" poster presentation at Association for Research in Vision and Ophthalmology Annual meeting in Fort Lauderdale, FL May, 1999
- **Mathers WD**, Lane, JA: "The relationship between Sex Hormone levels and Tear Function in Women with Sjogren's Syndrome" poster presentation at Association for Research in Vision and Ophthalmology Annual meeting in Fort Lauderdale, FL : May, 1999
- Lane JA, **Mathers, WD**: "The Relationship Between Sex Hormones and Meibomian Gland Function in Men and Women" poster presentation at Association for Research in Vision and Ophthalmology Annual meeting in Fort Lauderdale, FL . May, 1999
- **Mathers, WD** "Corneal Research at The Casey Eye Institute" presented at Oregon Association of Ophthalmology meeting, Portland, OR. May 1999
- **Mathers, WD** "New Treatments of Dry Eye" slide presentation at Columbia Gorge Seminar for Cataract, Cornea & Refractive Surgery, Stevenson, WA. Jul. 1999
- **Mathers, WD** "Management of Surface Disease/Keratitis" slide presentation at Columbia Gorge Seminar for Cataract, Cornea & Refractive Surgery, Stevenson, WA. Jul. 1999
- **Mathers, WD** "Confocal Examination of the Tear Film" Presented at Japan Contact Lens Society 42<sup>nd</sup> Annual Meeting, Yokohama, Japan Jul. 1999
- **Mathers, WD** "New Methods of Diagnosing Acanthamoeba Keratitis " Slide presentation at Japan Contact Lens Society 42<sup>nd</sup> Annual Meeting, Yokohama, Japan Jul. 1999

- **Mathers, WD** “Extended Wear Use Issues For Contact Lens Patients” Slide presentation at the XXII Congress of the Pan-American Association of Ophthalmology, Orlando, FL. Oct. 1999
- **Mathers, WD** “Dry Eye Syndrome” Slide presentation for the Willamette Ophthalmic Society, Salem, OR. Nov. 1999
- **Mathers, WD** “Measurement of the Tear Film: A Review” Jonathan Kersley Guest Lecture Presented at The Medical Contact Lens and Ocular Surface Association Annual Meeting, London, Dec. 1999

## 2000

- **Mathers, WD.** “Why the Eye Becomes Dry” Slide presentation for Beren’s Memorial Lecture at the Contact Lens Association of Ophthalmologists Annual Meeting, Las Vegas, NV. Jan. 2000
- **Mathers, WD** “Dry Eye and Sjogren's Syndrome-Why People Get Dry Eye” Presented at Healthy Talks-Focus on Eye Care ,OHSU, Portland, OR. Apr. 2000
- **Mathers WD, Dolney AM** “ Objective Demonstration of Tear Film Stimulation with Oral Pilocarpine in Dry Eye Patients” poster presentation at Association for Research in Vision and Ophthalmology Annual meeting in Fort Lauderdale, FL . May, 2000
- **Mathers, WD** “Acanthamoeba Keratitis: Diagnosis and Management” slide presentation at Columbia Gorge Seminar for Cataract, Cornea & Refractive Surgery, Stevenson, WA. 7/00
- **Mathers, WD** “Blepharitis and Dry Eye” slide presentation at Columbia Gorge Seminar for Cataract, Cornea & Refractive Surgery, Stevenson, WA. Jul. 2000
- **Mathers, WD.** “Laser Correction and Refractive Errors” slide presentation at Portland Rotary Club meeting, Portland, OR. Aug. 2000
- **Mathers, WD.** “Why the Eye Becomes Dry” slide presentation at Oregon Ophthalmic Alumni Association meeting, Portland, OR. Sept. 2000
- **Mathers, WD** “ Meibomian Gland Disease: An Overview” slide presentation at International Congress of Eye Research, Santa Fe, NM Oct. 2000
- **Mathers, WD** “Managing Contact Lens Complications” PowerPoint presentation at The Resident Course on Optics, Refraction and Contact Lenses, CEI Portland, OR. Oct. 2000
- **Mathers, WD** “ The Use of Confocal Microscopy in Refractive Surgery” Powerpoint presentation at Collaborative Ophthalmology Rounds at The Devers Eye Institute Portland, OR. Nov. 3, 2000

## 2001

- **Mathers, WD** “Applications of Confocal Microscopy in Refractive Surgery” Presentation for The Portland Metropolitan Optometrics Society Portland, OR. Jan 2001
- **Mathers, WD** “Opticians Association Of Oregon, Optical Odyssey-2001” Presentation for Refractive Surgery and the role of the Optician. Casey Eye Institute March 2001
- **Mathers WD**, “National Eye Institute: Dry Eye Workshop”. Conducted at the Association for Research in Vision and Ophthalmology Annual meeting in Fort Lauderdale, FL. May, 2001
- **Mathers, WD**, “Vision 2001: A Comprehensive Ophthalmology Update, Dry Eye in LASIK Patients”, Presentation at Casey Eye Institute, OHSU, September 2001.
- **Mathers, WD**, “Confocal Microscopy, Theory and Applications. How you could use this instrument.” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001
- **Mathers, WD**, “Dry Eye Theory and Practice.” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001
- **Mathers, WD**, “Confocal Microscopy, Theory and Application: How you could use this instrument” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001
- **Mathers, WD**, “Acanthamoeba Keratitis” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001
- **Mathers, WD**, “Contact Lens Update, Complications, Projections for the Future” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001
- **Mathers, WD**, “Tear Film Examination, What is useful to measure and why” Presentation at Brazilian Congress of Ophthalmology, Sao Paulo, Brazil, September 2001

## 2002

- **Mathers, WD**, “Dry Eye Perspective, How physiologic tests relate to ocular surface disease.” Presentation at New England Ophthalmological Society, Boston, MA, April 2002.
- **Mathers, WD**, “Chronic external disease can be acanthamoeba.” Presentation at New England Ophthalmological Society, Boston, MA, April 2002.

## 2003

- **Mathers, WD**, “The View From Within: In Vivo Confocal Microscopy of Leukocyte-Endothelial Dynamics in Patients with Uveitis or Scleritis.” Presentation at ARVO Annual Meeting, Fort Lauderdale, Florida, 2003.
- **Mathers, WD**, “Long Term Changes in Lacrimal Gland Gene Expression Following Corneal Trauma.” Presentation at ARVO Annual Meeting, Fort Lauderdale, Florida, 2003.

- **Mathers, WD**, "Possible Increased Leukocyte Adhesion in Patients Who Wear Overwear Soft Contact Lenses or Wear Contact Lenses with Lower Dk Values". Presentation at ARVO Annual Meeting, Fort Lauderdale, Florida, 2003.
- **Mathers, WD**, "Acanthamoeba Sensitivity Testing Results for Various Antamoebicidal Medications and Concentrations." Presentation at ARVO Annual Meeting, Fort Lauderdale, Florida, 2003.
- **Mathers, WD**, "Leukocyte Dynamics and Confocal Microscopy of the Human Conjunctiva." Presentation at X Biennial Western Eye Research Conference, Laguna Beach, California, September 2003.